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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/032,817	12/27/2001	Gary A. Coen	BOEI-1-1038	6942

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BLACK LOWE & GRAHAM, PLLC
701 FIFTH AVENUE
SUITE 4800
SEATTLE, WA 98104

EXAMINER	
FERNANDES, CHERYL M	
ART UNIT	**PAPER NUMBER**
2163	

DATE MAILED: 09/23/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/032,817	COEN, GARY A.	
	Examiner	Art Unit	
	Cheryl M. Fernandes	2163	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 June 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-28* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-28* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *27 December 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. This communication is responsive to the Request for Continued Examination filed June 22, 2005. Claims 1-28 are presented for examination. Claims 1, 2, 15, and 16 have been amended.

Response to Arguments

2. Referring to the 35 USC 112 first paragraph rejection for claims 2, 3, 16, and 17, Applicant's amendments to the claims are acknowledged. As such, the 35 USC 112 first paragraph rejections toward claims 2, 3, 16, and 17 are withdrawn.

3. Applicant's arguments with respect to claims 1-28 have been considered but are moot in view of the new ground(s) of rejection.

4. Referring to claims 1 and 15, in response to applicant's arguments, the recitation "a method for viewing a data dictionary structure" has not been given patentable weight because the recitation occurs in the preamble. A preamble is generally not accorded any patentable weight where it merely recites the purpose of a process or the intended use of a structure, and where the body of the claim does not depend on the preamble for completeness but, instead, the process steps or structural limitations are able to stand alone. See *In re Hirao*, 535 F.2d 67, 190 USPQ 15 (CCPA 1976) and *Kropa v. Robie*, 187 F.2d 150, 152, 88 USPQ 478, 481 (CCPA 1951).

5. Referring to claims 4-7 and 18-21, Applicant argues that Can fails to teach determining a lexical stability value for each node. However, Examiner respectfully

disagrees. Examiner respectfully submits that Can discloses determining a lexical stability value for each document or node *m* in an index vocabulary database (refer to footnote 4 in rejection below). Therefore, Examiner asserts that Can does teach determining a lexical stability value for each node.

6. Referring to claims 8-12 and 22-26, Applicant argues that Fayyad fails to teach displaying and determination of an aggregate stability value. However, Examiner disagrees. Fayyad clearly teaches a monitor (col. 17, lines 26-28) for practicing the data-mining engine (col. 16, lines 43-44) and creating an output model from data within a database (col. 6, lines 41-47). Fayyad also teaches determining stability of clusters, wherein if every cluster is stable with respect to at least one other cluster then its nearest neighbor search will be well defined (col. 12, line 33 – col. 13, line 67).

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 1-28 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Referring to claims 1 and 15, the claims recite the limitation "the determined lexical nodes" in para. 6 of claim 1 and in para. 7 of claim 15. However, it is unclear as to which of the determined lexical nodes are being referred to- the plurality of

determined lexical nodes (see para. 3 and 4 of claims 1 and 15 respectively) or the 'other determined lexical nodes' (see para. 5 and 6 of claims 1 and 15 respectively) as previously mentioned in the claims.

Due to the 35 USC 112 rejections made, the claims have been treated as best understood by the examiner.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

8. Claims 1-3, 13-17, 27, and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent Number 6,446,081 B1 issued to Preston, and further in view of US Patent Number 5,724,594 issued to Pentheroudakis.

Referring to claims 1 and 15, Preston discloses:

A computer method and system for viewing a data dictionary structure (Abstract), the system comprising a processor (Abstract) comprising:

- a first component configured to retrieve a data dictionary ('stored lexical table', col. 2, lines 57-61; 'lexical database', col. 10, lines 20-24, Fig. 9a, element 234; access of lexical database, Fig. 15b, element 724) including terms ('dictionary entries', col. 3, lines 5-14; 'object', col. 7, lines 1-7; col. 7, lines 21-24, Fig. 7, elements 510, 520) and term definitions ('meaning', col. 3, lines 5-14; 'meaning' field, col. 7, lines 21-25; Fig. 7, elements 514, 524);

- a second component configured to determine all lexical nodes of the data dictionary based on the terms (col. 8, lines 27-43; locate objects of lexical database, Fig. 15b, element 726; col. 12, lines 63-67);
- a third component configured to parse each term's definition (Abstract; col. 8, lines 44-47; Fig. 8, element 610);
- a fourth component configured to determine dependencies of each lexical node based on the parsed definitions and the terms associated with the other lexical nodes ('pointer data' indicates semantic dependencies, col. 7, lines 1-10; 'pointer fields'[1], col. 7, lines 21-32, 'linked from', 'linked to', Fig. 7, elements 518, 519, 528, 529; col. 9, lines 27-37; Fig. 14, elements 662, 664);
- a fifth component configured to generate a lexical graph (Fig. 11a-b) based on the determined lexical nodes and the determined dependencies (Abstract; 'display control data' generated, col. 7, lines 1-10); and
- a display coupled to the processor and configured to display at least a portion of the generated lexical graph (Abstract; col. 1, lines 63-67; col. 7, lines 31-50, Fig. 5b; col. 9, lines 37-42; col. 10, lines 36-51 and 58-64, Fig. 11a-b; col. 10, line 65- col. 11, line 3, Fig. 13; 'semantic dictionary', Fig. 24b).

However, while Preston teaches all of the above claimed subject matter, Preston remains silent as to the data dictionary including metadata terms and their definitions and that each lexical node of the data dictionary is associated with a metadata term and the term's definition.

However, Pentheroudakis teaches analogous art that includes a machine-readable data dictionary that includes metadata terms and their definitions (Abstract; Summary) and that each lexical node (semantic relation entry) of the data dictionary is associated with a metadata term (head word) and the term's definition (Abstract; Summary; col. 2, lines 43-55).

It would have been obvious to a person of ordinary skill in the art at the time that the invention was made to modify Preston to further include a data dictionary including metadata terms and their definitions and that each lexical node of the data dictionary is associated with a metadata term and the term's definition, as taught by Pentheroudakis.

The ordinary skilled artisan would have been motivated to modify Preston per the above for the purpose of automatically deriving semantic information from Machine-readable dictionaries (MRDs) and deriving morphological information from a MRD (Pentheroudakis, col. 1, lines 8-12; col. 2, lines 8-10).

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[1] The interconnection between objects is derived by the pointer fields thereby allowing the determination of dependencies of each lexical node.

Referring to claims 13 and 27, the combination of Preston/ Pentheroudakis discloses modifying at least one definition associated with the terms of one or more lexical nodes, parsing the at least one modified definition, redetermining dependencies of each lexical node based on the previous parsed definition, parsed modified definition, and the terms associated with the other lexical nodes, and regenerating the lexical graph based on the redetermined dependencies (Preston, col. 8, line 44- col. 9, line 7; col. 10, line 65 – col. 11, line 19; col. 16, lines 20-30).

Referring to claims 14 and 28, the combination of Preston/ Pentheroudakis discloses adding a lexical node by inserting a term and term definition; parsing the term definition of the added lexical node; redetermining dependencies based on the previous parsed definitions, the parsed definition of the added lexical node, and the terms associated with the other lexical nodes; and regenerating the lexical graph based on the redetermined dependencies (Preston, col. 8, line 44- col. 9, line 7; col. 10, line 65 – col. 11, line 19; col. 16, lines 20-30).

Referring to claims 2, 3, 16, and 17, the combination of Preston/ Pentheroudakis discloses:

- that the determined dependencies are selected from a list comprised of a cyclical type dependency (claims 2 and 16) (Preston, col. 18, lines 44-52)[2]; and
- generating node icons based on the dependency type (claims 3 and 17)(Preston, 'codes' indicating the level of difficulty, complexity or obscurity of each entry in the lexical table, col. 11, lines 31-40)[3].

9. Claims 4-7 and 18-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Preston in view of Pentheroudakis as applied to claims 1 and 15 above, in view of *'A dynamic cluster maintenance system for information retrieval'* by Can et al. (hereafter Can).

Referring to claims 4-7 and 18-21, the combination of Preston/ Pentheroudakis discloses all of the claimed subject matter as set forth above but fails to disclose:

- determining a lexical stability value for each lexical node (claims 4 and 18);
- displaying the determined lexical stability value with the associated lexical node in a lexical graph (claims 5 and 19);
- determining that the lexical stability value comprises dividing the number of nodes that lexically depend on a current node by the number of nodes that lexically depend on the current node plus the number of nodes that the current node lexically depends from (claims 6 and 20); and

[2] In this citation Preston discloses a cyclical dependency (as defined in para. 21 of the instant specification) where a determination of a sequence is made wherein event A is expected to cause event B but B is expected to cause A.

- determining an aggregate stability value (claims 7 and 21).

However, referring to claims 4-7 and 18-21, Can teaches analogous art wherein the following is taught:

- determining a lexical stability value for each lexical node (Abstract; pages 123-130)[4] (claims 4 and 18);
- displaying the determined lexical stability value with the associated lexical node in a lexical graph (Fig. 1, 2, and 3) (claims 5 and 19);
- determining that the lexical stability value comprises dividing the number of nodes that lexically depend on a current node by the number of nodes that lexically depend on the current node plus the number of nodes that the current node lexically depends from ('centroid entry', page 129, part 4.5 (b)) (claims 6 and 20); and
- determining an aggregate stability value (Abstract; page 127, Section 4.3 till part (e)) (claims 7 and 21).

It would have been obvious to a person of ordinary skill in the art at the time that the invention was made to modify the combination of Preston/ Pentheroudakis to further include determining and displaying a lexical stability value for each lexical node, furthermore determining that the lexical stability value comprises dividing the number of

[3] Referring to para. 21 of the instant specification, an icon is defined as a status symbol. Examiner respectfully asserts that a code for each entry in the lexical table is a status symbol.

nodes that lexically depend on a current node by the number of nodes that lexically depend on the current node plus the number of nodes that the current node lexically depends from, and determining an aggregate stability value as taught by Can.

The ordinary skilled artisan would have been motivated to modify the combination of Preston/ Pentheroudakis per the above for the purpose of judging the effectiveness of a cluster maintenance scheme, that is, for the purpose of enabling new additions to be made into a cluster, while not causing noticeable changes to be made in the original cluster. Additional motivation includes the ability of the clustering strategy of Can to handle dynamic cluster maintenance efficiently and effectively (Can, see page 126, Section 4; Conclusion, Section 5).

10. Claims 8-12, and 22-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Preston, in view of Pentheroudakis, in view of Can as applied to claims 7 and 21 above, and further in view of Fayyad.

Referring to claims 8-12, and 22-26, the combination of Preston/Pentheroudakis/Can discloses all of the claimed subject matter as set forth above, however fails to disclose:

- displaying an aggregate stability value (claims 8 and 22);
- determining that the aggregate stability value of a current node comprises adding the lexical stability values of all nodes that are lexically dependent

[4] A lexical stability value is determined for each document, *m*, in an index vocabulary database by a 'CC Based Cluster Maintenance' algorithm in order to assess stability or similarity characteristics of documents within the database.

upon the current node to the current node's lexical stability value (claims 9 and 23);

- determining a global stability value by summing lexical stability values of all nodes (claims 10 and 24);
- determining a fractional stability value for each node based on the aggregate and global stability values (claims 10 and 24);
- displaying the determined fractional stability value for each node (claims 11 and 25); and
- determining that the fractional stability for a current node comprises dividing the current node's aggregate stability value by the global stability value (claims 12 and 26).

However, referring to claims 8-12, and 22-26, Fayyad teaches analogous art wherein the following is taught:

- displaying aggregate stability values (or probability density values, *h1* and *h2*) (col. 6, lines 10-27; Fig. 5) (claims 8 and 22);
- determining that the aggregate stability value of a current node comprises adding the lexical stability values of all nodes that are lexically dependent upon the current node to the current node's lexical stability value ('probability density function (pdf)', col. 9, line 14- col. 10, line 23) (claims 9 and 23);
- determining a global stability value by summing lexical stability values of all nodes (*h1+h2+Hrest*, where '*Hrest* is the sum of the heights of the curves for

all other clusters' (Gaussians *G1*, *G2* and *G3*), col. 6, lines 10-40; Fig. 5) (claims 10 and 24);

- determining a fractional stability value (or a 'weighting factor' of the membership of a data point *X* to clusters *G1* and *G2*, col. 6, lines 10-40, Fig. 5) for each node based on the aggregate and global stability values (claims 10 and 24);
- displaying the determined fractional stability value for each node (See Fig. 5 with regard to the distance between data point X , X1 and X2; col. 6, lines 17-40)[5] (claims 11 and 25); and
- determining that the fractional stability for a current node comprises dividing the current node's aggregate stability value by the global stability value (Refer to discussion of claims 10 and 24 above; the weighting factor of h1 to cluster G1 is given by '*h1/ h1+h2+hRest*') (claims 12 and 26).

It would have been obvious to a person of ordinary skill in the art at the time that the invention was made to modify the combination of Preston/Pentheroudakis/Can to further include displaying aggregate stability values, determining a global stability value, determining and displaying a fractional stability value for each node, and furthermore determining that the fractional stability for a current node comprises dividing the current node's aggregate stability value by the global stability value, as taught by Fayyad.

[5] The distances from data point X to the other points X1 and X2 indicate the fractions of X that belong to cluster G1 and cluster G2 (0.8 and 0.2 respectively, as indicated in col. 6, lines 35-40).

The ordinary skilled artisan would have been motivated to modify the combination of Preston/Pentheroudakis/Can per the above for the purpose of using probability density to decide how data should be reorganized for efficient nearest neighbor queries (Fayyad, Abstract; col. 3, lines 2-5). Additional motivation would be to a clustered index structure and a statistical model of clustered data in a database in order to determine how data should be partitioned. The model can be used in order that data meets certain 'stability' conditions and that clusters do not overlap. These stability conditions are important because they enable a database design utility to decide whether the indexing method is likely to be useful for a given database (Fayyad, col. 3, lines 6-30).

Conclusion

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cheryl M Fernandes who can be reached on (571) 272-4018. The examiner can normally be reached on 9:00 am - 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Safet Metjahic can be reached on (571) 272-4023. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

CMF
September 17, 2005

UYEN LE
PRIMARY EXAMINER